Content

Section 18
Uintah Basin Plan

Industrial Water

Although the use of water by industry in the basin is small, it serves many uses and carries a high value. Water is used industrially to generate power, as a solvent, for temperature control, for cleaning, to transport mining ore and concentrate, to convey sanitary wastes, and for aesthetics.

18.1 Introduction

This section discusses the present and future uses of water for industrial purposes in the Uintah Basin. For this report, industrial water use is defined as water used in mining and manufacturing operations, including the production of oil, gas, chemicals, fertilizer or any other product. It includes power production, processing, washing, mineral slurrying, oil well water-flooding and cooling operations, as well as employee use. Also included, to the extent they can be identified, are such activities as gravel washing and ready-mix concrete production.

18.2 Background

Major industrial uses of water are for potash mining operations at the fertilizer quarries and gilsonite mines, and also for power production at the Desert Generation & Transmission Power Plant. Water-flooding is also being used for injection wells in the oil fields. Because it is part of a patented mining process, the actual amount of water used is considered confidential information. This is typical of many industrial water uses.

18.3 Current and Projected Industrial Water Use

No single agency or entity promotes and monitors the development or use of industrial water, although its use must conform to existing state laws for water rights, pollution control, and other state rules and federal regulations. The State Engineer's Office has surveyed and published statewide industrial water-use data for several years. Although the State Engineer's Office will not divulge the quantity of water used by individual industrial water users, the office has reported the collective 1996 total industrial water use in the Uintah Basin from privately held water rights as 11,830 acre-feet. The


Oil refinery in the Uintah Basin

1996 data on privately held industrial water rights is shown in Table 18-1. The majority of the privately developed industrial water comes from wells, with only 1,020 acre-feet coming from surface water and springs. In addition to the privately held water rights used for industrial purposes, many industries use water purchased from wholesale suppliers.

Table 18-1 Self-Supplied Industrial Water Use		
	Depletions (Acre-Feet/Year)	
	1996	2050
Privately Held Water Rights[a]		
Surface Water and Springs	1,020	1,020
Wells	10,810	22,680
TOTAL	11,830	23,700

[a]Water use data provided by the Utah Division of Water Rights.

Water planners and managers need to provide for the future construction of treatment and distribution facilities to accommodate an expected increase in industrial water demand. In contrast to residential and commercial water uses which grow somewhat uniformly with population, future industrial use is difficult to predict. Future enlargement of Desert Generation and Transmission Power Plant and phosphate operations could increase depletions to 23,700 acre-feet by the year 2050.

18.3.1 Oil and Gas Well Production[116,99]

About 2,280 oil wells and 1,270 gas wells presently exist in the Uintah Basin. More than 300 wells will be drilled within the Monument Butte Oil Field between 1997 and 2050. About 500 wells are in production. Based on a 40-acre spacing pattern, about 50 percent will be injection wells. Water obtained from other wells and surface water will be injected into the oil and gas bearing zones to force more oil and gas to the surface. The water-flooding would increase ultimate oil recovery by about 350 percent. This secondary recovery method could yield approximately 18 million barrels of oil in the Monument Butte Oil Field.

The Chevron Greater Red Wash Oil Field has been using water-flooding since 1982. Water is injected into the injection wells to a depth of 5,200 feet until the original pressure of the oil reservoir is reestablished. Oil recovery rates increase until the water has pushed the oil and gas to the producing wells. After water reaches the production well, some water is forced to the surface with the crude. The water will be separated from the oil and gas and re-injected into the oil field. Once the oil field has been repressurized, only the oil, gas and water pumped from the well will need to be replaced. The life of the oil field can be increased by 10 to 15 years. The U. S. Fish and Wildlife Service (FWS) is currently reviewing a Bureau of Land Management Environmental Assessment for oil and gas production in the Uintah Basin. The cumulative impacts section states that approximately 4,213 new wells will be drilled in the next 10-15 years. The FWS is concerned about potential impacts of underground injection on the endangered Colorado River fishes.

The underground injection of water is monitored by the Utah Division of Oil, Gas and Mining.

18.3.2 Mineral Mining and Processing

Gilsonite companies mine about 60,000 tons of gilsonite annually in the basin. Gilsonite is used in car batteries, paints, varnishes, anti-corrosive coatings, insulating and water-proofing jackets for underground pipes and automotive sealers. More recently, gilsonite has been used in the manufacture of metallurgical-grade carbon coke and high-purity carbon electrodes for the nuclear power industry. Water is used in dust control and processing of the gilsonite.

Tar sands and oil shale are also prevalent in the Uintah Basin. The Division of Water Resources designed the White River Dam Project to furnish water for the oil shale boom. The project projected a 75,000 acre-feet depletion of water resources in the final Environmental Impact Statement by the Bureau of Land Management. The dam was never built due to a reduction in the price of oil on the world market and the increased cost to recover oil from oil shale.

Phosphate rock is mined at the S. F. Phosphates Limited Company quarry near Vernal. The Vernal mine and mill are currently capable of producing about 1.3 million tons of phosphate concentrate per year. The original plant was constructed in 1960. A new expansion of the Vernal and Rock Springs plants will increase their production by 26 percent.

Table 18-2
Hydroelectric and Coal-Fired Power Plants

Name	River	Capacity[a]	Owner
DG&T[b]	White River	450,000 kw	Desert Generation & Transmission Co-Op
Sand Wash	Lake Fork River	2,000 kw	Mistletoe Finance Company
Yellowstone	Yellowstone River	900 kw	Moon Lake
Uinta	Uinta River	1,200 kw	Moon Lake
Flaming Gorge	Green River	145,850 kw	Bureau of Reclamation

[a]Department of Natural Resources, Office of Energy and Resource Planning, *A Survey of Small Hydroelectric Potential at Existing Sites in Utah,* 1980.
[b]Coal-fired.

Construction started during the summer of 1998, with completion planned for January 2000. A 96-mile pipeline transports the phosphate slurry to a fertilizer plant in Rock Springs, Wyoming. Four on-site wells and two springs provide the water for the ore processing and slurry pipeline. The system has total containment with no water being released to Brush Creek.

18.3.3 Hydroelectric and Coal-Fired Power Plants

Hydroelectric power plants generate power by the use of pressure head either from the height of the dam or a pipeline from a canyon of higher elevation. The basin has four hydroelectric power plants. Flaming Gorge is the largest, with a capacity of 145,850 kilowatts. The Sand Wash Hydro, Yellowstone River and Uinta River plants are smaller, with a total capacity of 4,100 kilowatts. These hydroelectric power plants do not deplete water from the system.

Deseret Generation & Transmission Cooperative (DG&T) is a utility serving six rural electric distribution cooperatives in Utah and four adjacent states. The systems serve about 30,000 consumers. The plant burns about 200 tons of coal per hour and produces about 450,000 kilowatts of power. Coal is shipped from Rangely, Colorado, on a DG&T electric rail system. Water for cooling and processing is transported by pipe from wells along the Green River in the Jensen area to the DG&T plant. The waste effluent from the cooling towers is piped to lined evaporation lagoons. All water is evaporated, either during the cooling process or in the lagoons. Hydroelectric and coal-fired power plants are shown in Table 18-2. ❑